

REMARKS

Reconsideration of the above-referenced application in view of the following remarks is respectfully requested.

Claims 7-26 are pending in this application.

Claims 7-10 and 13-26 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Molla, et al. (U.S. Patent No. 6,362,089) in view of Ahmad, et al. (U.S. Patent No. 5,436,412). Applicant respectfully traverses the rejection. Claim 7 includes the step of "plating a layer of a bondable metal, by electroless deposition, said bondable metal and the thickness thereof coordinated such that said layer reduces the diffusion of said barrier metal at 250 °C by more than 80 % compared with the absence of said bondable metal, thereby forming the outermost bondable metal layer of said bond pad." Molla's gold layer is "between approximately 0.03 microns and 0.06 microns." Applicant's specification (page 13, line 20) teaches that a thickness of about 0.4 to 1.5 um is needed to meet the reduction criteria recited in Claim 7. Applicant's range is 7 to 25 times thicker than the top end of Molla's range. Molla's method does not satisfy nor does it anticipate or suggest the criteria set forth for the bondable layer in Claim 7.

The Examiner acknowledges this deficiency of Molla and cites Ahmad to cure the shortcomings of Molla. The Examiner asserts that Ahmad teaches "gold being a few microns thick." However, the cited passage of Ahmad reads as follows "N(P) and Co(P) and gold are deposited by electroless plating and are a few microns thick." Applicant respectfully submits that this is not necessarily a teaching that the *gold* is a few microns thick; instead, Applicant understands Ahmad's description to mean that the thickness of the several metal layers is a few microns thick *in total*. The "few microns thick" dimension is clarified somewhat further in col. 5 at line 46 of Ahmad, where it is stated that ". . . caps

42, 44 of nickel(P) or cobalt (P) followed by gold are deposited by electroless plating at a thickness of 1 to 2 microns. . . ." Thus, there is no reason to believe that the gold layer thickness used by Ahmad is any thicker than that taught by Molla. In the *Response to Arguments* section of the Office Action, the Examiner argues that, given Ahmad's teaching of a three layer metallization having a thickness of a few microns, it is obvious that each metallization layer would have approximately 1 micron in thickness. Applicant respectfully disagrees with the Examiner's reasoning. There is nothing in Ahmad to indicate that all three metal layers have the same or anywhere near the same relative thicknesses. More specifically, there is nothing to indicate that Ahmad's gold layer is 0.4 micron or greater in thickness. Since the combined Molla and Ahmad references fail to teach all of the features of the claimed invention, Applicant respectfully submits that Claim 7 is patentable over Molla in view of Ahmad. Claims 8 and 13-15 depend from Claim 7 and are therefore patentable for at least the reasons presented above.

Additionally, Claim 14 includes the step "wherein said electroless plating of said bondable metal layer is immersion plating followed by autocatalytic plating." It is acknowledged in the Office Action that Molla does not teach autocatalytic plating, but the Examiner argues that autocatalytic plating is well known in the art and that Molla teaches the use of techniques for forming a layer of gold that are well known to those skilled in the art. However, Applicant points out that Claim 14 does not simply recite the use of autocatalytic plating, but rather combines two different plating techniques. Neither Molla nor Ahmad teaches or suggests such an approach. In the Office Action, the Examiner argues that it is obvious to use both methods as immersion plating is known to form thin layers while autocatalytic plating is known to form thicker layers. Therefore, the Examiner reasons, it would have been obvious to form an initial thin layer by immersion plating and then use autocatalytic plating to provide the thicker layer. First, Applicant respectfully submits that there is no support in the cited references for the Examiner's assertion as to what is known in the art about immersion and autocatalytic plating. Second, even if such support existed, there

is nothing in the cited references to suggest a combination of immersion and autocatalytic deposition methods. Therefore, Applicant respectfully submits that the rejection is improper and should be withdrawn.

Claim 16, as amended, includes the step of "plating on said barrier layer a bondable layer, by electroless deposition, said bondable layer having a thickness of at least about 0.4 μm , said bondable layer selected from a group consisting of gold, palladium, platinum, and silver." Claim 22, as amended, includes the step of "plating on said layer of nickel a layer of gold, by electroless deposition, said layer of gold having a thickness of at least about 0.4 μm ." As indicated above with respect to Claim 7, Molla does not teach a bondable layer having a thickness of at least about 0.4 μm . In addition, as argued above, there is no reason to believe that the gold layer thickness used by Ahmad is any thicker than that taught by Molla. For at least this reason, Applicant submits that Claims 16 and 22 are patentable over Molla in view of Ahmad. Claims 17-21 and 23-26 depend from Claims 16 and 22 and are therefore patentable over Molla in view of Ahmad for at least the reasons presented above.

Claims 17 and 23 include the steps of "conducting a self-limiting surface metal replacement; and conducting an autocatalytic deposition." It is acknowledged in the Office Action that Molla does not teach autocatalytic deposition, but the Examiner argues that autocatalytic deposition is well known in the art and that Molla teaches the use of techniques for forming a layer of gold that are well known to those skilled in the art. However, Applicant respectfully points out that Claims 17 and 23 do not simply recite the use of autocatalytic deposition, but rather combine two different plating techniques. Neither Molla nor Ahmad teaches or suggests such an approach. In the Office Action, the Examiner argues that it is obvious to use both methods as immersion plating is known to form thin layers while autocatalytic plating is known to form thicker layers. Therefore, the Examiner reasons, it would have been obvious to form an initial thin layer by immersion plating and then use autocatalytic plating to provide the thicker layer. First, Applicant respectfully submits that there is no support in the cited references for the Examiner's assertion as to what is known in the art

about immersion and autocatalytic plating. Second, even if such support existed, there is nothing in the cited references to suggest a combination of immersion and autocatalytic deposition methods. Therefore, Applicant respectfully submits that the rejection is improper and should be withdrawn.

Claims 11 and 12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Molla with Ahmad and further in view of Lopatin, et al. (U.S. Patent No. 6,320,263). Applicant respectfully traverses the rejection. As indicated above, Claim 7 contains features not taught or suggested by Molla or Ahmad. Lopatin does not cure the deficiencies of Molla and Ahmad. Claims 11 and 12 depend from Claim 7 and are therefore patentable over the combined references for at least the reasons presented above.

Claims 7-26 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 16-25 of copending Application No. 09/775,322. Application No. 09/775,322 has been abandoned. Therefore, Applicant respectfully requests that the rejection be withdrawn.

Applicant respectfully requests reconsideration and withdrawal of the rejections and allowance of Claims 7-26. If the Examiner has any questions or other correspondence regarding this application, Applicant requests that the Examiner contact Applicant's attorney at the below listed telephone number and address.

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Respectfully submitted,



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